

## PARASITISATION RATES OF SOME PARASITOIDS (HYMENOPTERA: ICHNEUMONIDAE) OF THE AUTUMN GUM MOTH (LEPIDOPTERA: GEOMETRIDAE)

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### Abstract

Information is provided on one tachinid (Diptera) and four ichneumonid (Hymenoptera) parasitoids of the autumn gum moth *Mnesampela privata* (Guenée) (Geometridae). Parasitisation rates are given for the unidentified tachinid and the ichneumonid *Heteropelma scaposum* (Morley) (Anomaloniinae). A combined parasitisation rate is given for an unidentified species of *Pristicerus* Gravenhorst plus an undescribed species of *Neolevansa* Gauld (both Ichneumoninae: Platylabini). This is the first host record for any *Neolevansa* species. Also reported as a parasitoid is an unidentified species of *Eriborus* Förster (Campopleginae). An earlier report of an ichneumonid from the genus *Anacis* Porter (Cryptinae: Cryptini) as a parasitoid of *M. privata* is corrected.

### Introduction

The autumn gum moth *Mnesampela privata* (Guenée) (Geometridae: Ennominae) is a serious pest of *Eucalyptus globulus* and *E. nitens* plantations in southeastern and southwestern Australia (Neumann and Collett 1997, Elliott *et al.* 1998). While studying the seasonal phenology of this moth, Lukacs (1999) collected data on its natural enemies, which we report in this paper.

### Materials and methods

Approximately 2,000 fifth (final) instar larvae of *M. privata* were collected from various sites in Tasmania and Victoria (see Lukacs 1999 for site details). One hymenopteran morphospecies of larval parasitoid was noticed and three specimens were kept for later identification. The *M. privata* pupae were reared under a number of different environmental regimes until an adult moth emerged, one or more parasitoids emerged or the pupa died. Parasitoids were separated into morphospecies. Emergence data were recorded for each cohort of pupae and each morphospecies of parasitoid. A small number of parasitoids were kept for later identification. All specimens are deposited in the Australian National Insect Collection (ANIC), Canberra.

### Results

#### *Identities of the parasitoids*

We identified the larval parasitoid as a species of *Eriborus* Förster (Ichneumonidae: Campopleginae). Lukacs (1999) initially recognised three morphospecies of larval-pupal parasitoids, a tachinid fly which was not identified further and two ichneumonids.

The larger of the ichneumonid morphospecies was identified as *Heteropelma scaposum* (Morley) (Anomaloniinae). On closer inspection, the smaller ichneumonid morphospecies actually comprised two species, both belonging to the subfamily Ichneumoninae, tribe Platylabini. One was a species of *Pristiceros* Gravenhorst while the other was an undescribed species of *Neolevansa* Gauld. Since we possess only one specimen of our species of *Neolevansa*, we have refrained from formally describing it as new. However, Table 1 (see also Figs 1-4) gives diagnostic features to distinguish this species, *Neolevansa* sp. 1, from the only described species of the genus, *N. hirsuta* Gauld. Note that according to Gauld (1984), there are 11 undescribed species of *Neolevansa* known, all from Australia.

**Table 1.** Characters for distinguishing *Neolevansa* sp. 1 from *N. hirsuta*.

Character	<i>Neolevansa hirsuta</i>	<i>Neolevansa</i> sp. 1
Area superomedia	A little longer than wide (Fig. 1)	Distinctly wider than long (Fig. 2)
Texture between punctures on metapleuron	Smooth and shining	Somewhat rugose
Predominant colour of head and mesosoma	Black (Figs 1, 3)	Reddish-brown (Figs 2, 4)
Pale yellow band along medioposterior margin of pronotum	Present	Absent
Number of pale yellow spots on lower mesopleuron	Two (Fig. 3)	One (Fig. 4)

#### *Oviposition behaviour in the field*

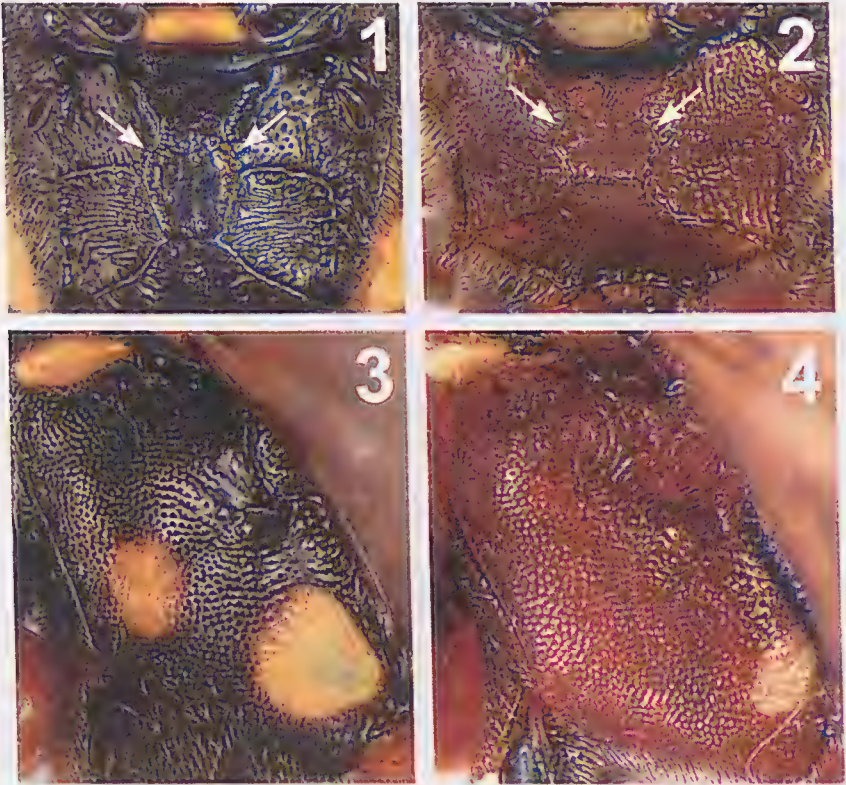
*Heteropelma scaposum* was observed ovipositing in first instar larvae but not in later instars. *Neolevansa* sp. 1 or *Pristiceros* sp. (identity uncertain) was usually seen walking over foliage and crawling into larval shelters in search of older larvae. It readily oviposited in fifth instar larvae it found exposed on the leaf surface inside thin silk shelters. Neither the *Eriborus* sp. nor the tachinid fly were observed in the field.

#### *Parasitisation levels*

A total of 1,211 *M. privata* pupae were formed in the laboratory. The parasitisation rates for cohorts of pupae ranged from 0.0% to 35.7%, with an overall rate of 9.1% (Table 2). Generally, the parasitoids emerged in synchrony with the moths, indicating that the development of both is tightly linked. Records were not kept for the larval parasitoid *Eriborus* sp.

**Table 2.** Parasitisation rates of three morphospecies of larval-pupal parasitoids.

Morphospecies	Average parasitisation rate	Range across cohorts
<i>Neolevansa</i> sp. 1 / <i>Pristicerus</i> sp.	4.6%	0.0-35.7%
<i>Heteropelma scaposum</i>	3.6%	0.0-16.7%
Tachinid fly	0.8%	0.0-8.3%
<b>Overall</b>	<b>9.1%</b>	<b>0.0-35.7%</b>



**Figs 1-4.** Propodeum and mesopleuron of *Neolevansa* spp. (1) *N. hirsuta*, propodeum; (2) *N. sp. 1*, propodeum; (3) *N. hirsuta*, mesopleuron; (4) *N. sp. 1*, mesopleuron.



## Discussion

*Mnesampela privata* constitutes the first host record for any species of *Neolevansa*. This association is not surprising given that almost all known hosts of Platylabini are geometrid moths (Gauld 1984). All of the other taxa, namely Tachinidae, *Eriborus*, *Pristiceros* and *Heteropelma scaposum*, have already been recorded as parasitoids of *M. privata* (Elliott and Bashford 1978, de Little 1981, Gauld 1984, Schumacher *et al.* 2000). Their parasitisation rates, though, have not previously been measured.

One of the preliminary identifications in Lukacs (1999) is incorrect. The morphospecies identified here as *Neolevansa* sp. 1/*Pristiceros* sp. was called *Anacis* sp. by Lukacs (1999). This error (albeit as ?*Anacis* sp.) was repeated by Schumacher *et al.* (2000), where on one occasion it was misspelt *Anacris* sp. This morphospecies was originally called *Anacis* sp. because of a suggestion by Ian Naumann (ANIC, Canberra), who did not examine specimens but merely commented on a photograph (Lukacs 1999, p. 238).

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